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**NON MEDICAL FUNGACIDE**

[非医学用殺菌剤]

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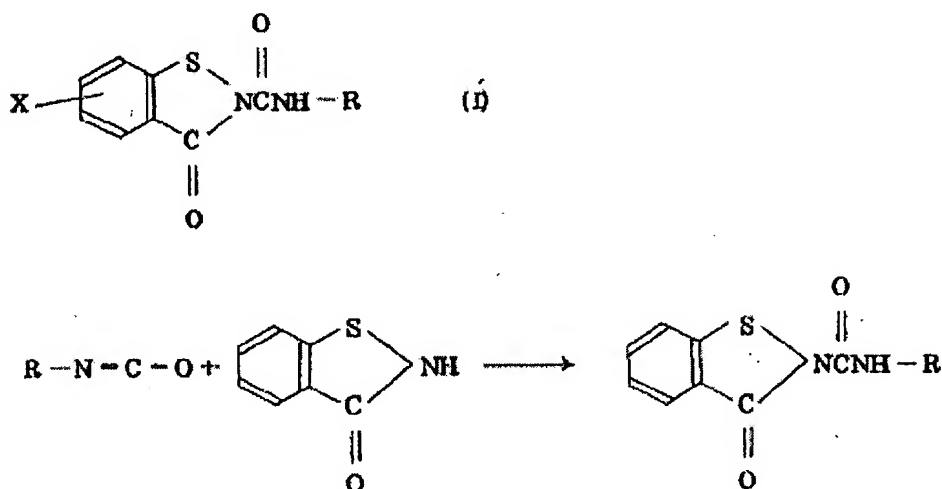
#### Detailed explanation of the present invention.

The present invention relates to the non medical fungicides characterized as containing the compounds represented by the following chemical formula as the effective ingredient (however, in

the formula, Y shows hydrogen atoms, or halogen atoms, R alkyl group, phenyl group, halo phenyl group, benzyl group or halo benzyl group);

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(However, in the formula R is same as before)

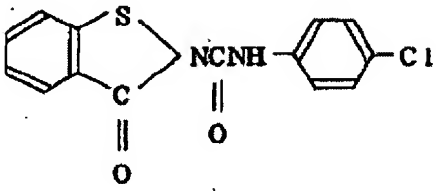
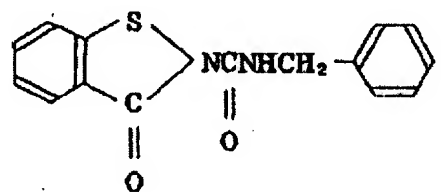
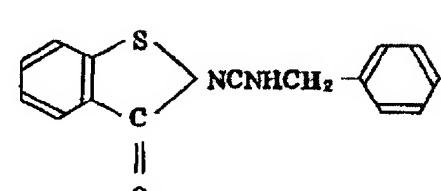
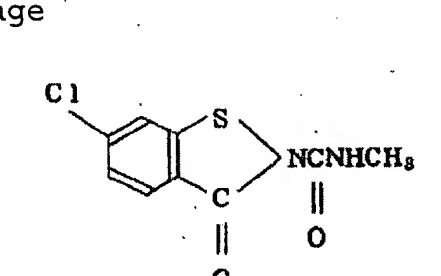
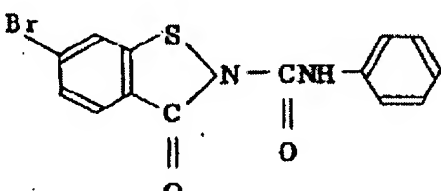


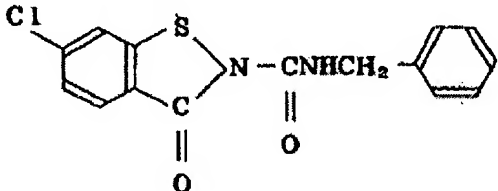
The inventors herein discovered that the compound represented by the aforementioned general formula (1) shows high antiseptic characteristics against various fungi such as rice/sesame leaf blight fungus, cucumber fusarium wilt fungus, kidney bean anthrax fungus, grapes banfu disease fungus, tomato leaves mildew disease fungus, pear black spot fungus, rice baroku sprout fungus, rice blast fungus and the like. The chemicals of the present invention have a low toxicity against the warm blooded animals, and have a wide usage as the horticultural insecticides, seeds disinfectant or industrial

chemicals. The compound shown in aforementioned general formula (I) has never been described in documents, and high yield can be easily produced by a method in which isocyanate types and 1,2 -benz isothiazole 3 on is used as is or it can be reacted in the organic solvent such as acetones and the like using base catalyst such as trimethyl amine or pyridine and the like and the effective ingredient compound of the chemical of the present invention is exemplified next.

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Structure formula shown on next page	Name, material value
	2- methyl carbamoyl benz isothiazoron 1 m.p. 175~176 deg c
	2- n butyl carbamoyl benz isothiazoron m.p. 63 ~ 66 deg c
	2- phenyl carbomolyl benz isothiazoron m.p. 199~ 200 deg c

	<p>2- p chloro phenyl carbamoyl benz isothiazoron</p> <p>m. p. 213~215 deg c</p>
	<p>2- benzyl carbamoyl benz isothiazoron</p> <p>m. p. 172~ 173 deg c</p>
	<p>2- p chloro benzyl carbamoyl benz isothiazoron</p> <p>m. p. 194~ 197 deg C</p>
<p>Page</p>  <p>3</p>	<p>2 -methyl carbamoyl 6- chloro benz isothiazoron</p> <p>m. p. 204~ 205 deg C</p>
	<p>2. p chloro phenyl carbamoyl 6- bromo benz isothiazoron</p> <p>m. p. 218~ 221 deg C</p>

	<p>2 - benzyl carbamoyl 6 chloro benz isothiazoron</p> <p>m. p. 179- 181 deg C</p>
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The chemicals of the present invention are used for removing various harmful organisms and used by making into well known various agent types suitable for each using situation. That is, agricultural chemicals are used for preventing and removing crop disease causing fungi and microorganism, for instance, for spraying to the stems and leaves of the crop, disinfecting the soil for cultivating crops, and seeds and, as industrial mildew preventive agent, for instance, is used for killing harmful microorganism for paper making process, Next, the embodied examples of the present invention will be explained in more detail showing embodied examples.

[Embodied example 1] (Powder agent). 2 parts of 2- methyl carbamoyl benz isothiazoron, 0.5 part of silica gel, 0.5 parts of calcium stearate, 50 parts of clay and 47 parts of talc are uniformly mixed by pulverizing mixer, thus obtaining powdery agent that contains 2% of effective ingredient. This agent is used by dispersing 3~ 5kg of powder per crop area per 10 are.

[Embodied example 2]

(Hydrated agent) 20 parts of 2- n butyl carbamoyl iso benz isothiazoron, 3 parts of calcium lignin sulfonate, two parts of sodium alkyl benzene sulfonate, 5 parts of nonyl phenyl polyoxy ethylene ether and 70 parts of clay are mixed uniformly by a powder pulverizing mixer, thus obtaining hydrated agent that contains 20% of effective ingredient. While 50~ 200g of this agent is added into 100 liter of water, while churning, made into uniform suspension solution, and is dispersed on the crop by a sprayer, or seeds are dipped into this, thus, used for removing disease causing agent of the crops or seeds.

[Embodied example 3] (Emulsified agent undiluted solution)

20 parts of 2- benzyl carbamoyl isothiazoron, 30 parts of cyclo hexane, 10 parts of Isobal 2020 (emulsifier made by Tohho Chemical Industry Inc) and 40 parts of xylol are mixed uniformly, thus obtaining emulsifier undiluted solution with 20% of effective ingredient. 50~200g of this undiluted solution is added into 100 liter of water while being churned, thus made into uniformly cloudy emulsifier and used. And in order to remove and prevent harmful microorganism for paper making process, the concentration of about 50~ 200ppm can be used.

[Embodied example 4] (Granule) 5 parts of 2- methyl carbamoyl 6- chloro benz isothiazoron, 0.5 parts of potassium lignin sulfonate, 0.1 part of polyvinyl alcohol, 50 parts of diatom earth and 44.4



parts of clay are uniformly mixed by powder pulverizing mixer, next, 5 to 50 parts of water is added,

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And after mixing and kneading by a mixing kneader, is pressed by a presser and is made dense, and dried by a drier, and then, pulverized by a pulverizer, thus obtaining the granules of 20 mesh ~ 80 meshes. This agent contains 5% of effective ingredient, and is dispersed by a granule applicator as is. And, in case the chemicals of the present invention are used as agricultural chemicals, it can be used by mixing with other chemicals, can be used by mixing with for instance, casgamyacin, cetyl and stearic rodan, metal salt methyl -1- (butyl carbamoyl) -2- benz imidazol carbamate of ethylene bis dithio carbamate, S- [1.2 -bis (methoxy carbonyl) ethyl] -0.0 -dimethyl phosphor dithiate, O. O -dimethyl-O- (3-methyl -4- nitro phenyl) phosphor thioate, O.O -dimethyl -S- (N -methyl carbamoyl methyl) phosphor dithioate, O.O -diethylO- (2-isopropyl -4- methyl -6- pyrimdinil) thio phosphate, O-ethyl phenyl -O- para nitro phenyl thio phosphate, O.O -dimethyl O- beta dichlor vinyl phosphate, 1.2.3.4.5.6 -hexaclor dichlor hexane, 1.1.1 -trichlor -2.2 -bis (para chlor phenyl) ethane, 1-naphtyl - N- methyl carbamate, 3.4 dimethyl phenyl N- methyl carbamate and the like, and its removal and preventive effect is not decreased. Hence, harmful insects of two types or more can be removed at the same time; furthermore, the synergistic effect by mixing can be expected. And this can be used

by mixing with other nematode killing agent and tick killing agent that are agricultural chemicals or fertilizer and the like.

Next, the effect of the chemicals of the present invention will be explained by showing testing example.

(Testing example 1)

(Testing the effect of disinfecting the seeds in the husks).

Naturally infected husks by rice bajikanae fungus are dipped into the diluted chemical solution with a specified concentration prepared hydrated according to the embodied example 2 for 24 hours at 20 deg C, then, washed by water twice, is dipped for 3 days into the vessel with a constant temperature at 28~ 30 deg C in order to promote its sprouting, and 400 grains per area was planted and cultivated in a vinyl house. 10 days after planting seeds as described below, the percentage of sprouting was checked, and on 25<sup>th</sup> day, infection rate and withering rate were checked. Next, this testing result is shown as in Table 1.  $\text{Sprouting rate (\%)} = (\text{sprouting number} / \text{planted husk number}) \times 100$ ;  $\text{Infection rate (\%)} = (\text{infected sprout number} / \text{sprouting number}) \times 100$ ;  $\text{Withered death rate (\%)} = (\text{withered sprout number} \times \text{sprout number}) \times 100$ ;

\*1: dipping concentration (ppm); \*2: sprouting rate (%):

\*3: disease outbreak (%); \*4: infection rate (%);

\*5: withered sprout number; \*6: withered sprout rate (%)

Name, material value	*1	*2	Baroku sprout disease		Withering rate	
			*3	*4	*5	*6
2- methyl carbamoyl benz	200	99.0	0	0	0	0
isothiazoron 1	100	99.5	0	0	0	0
2- n butyl carbamoyl benz	200	99.0	0	0	0	0
isothiazoron	100	99.0	0	0	0	0
2- phenyl carbomolyl benz	200	99.5	0	0	0	0
isothiazoron	100	99.5	2	0.5	0	0
2- p chloro phenyl	200	98.0	1	0.3	0	0
carbamoyl benz isothiazoro	100	98.5	3	0.8	0	0
2- benzyl carbamoyl benz	200	99.0	3	0.8	0	0
isothiazoro	100	99.5	4	1.0	0	0
2- p chloro benzyl	200	98.5	1	0.3	0	0
carbamoyl benz isothiazor	100	98.5	3	0.8	0	0
2 -methyl carbamoyl 6-	200	99.0	0	0	0	0
chloro benz isothiazoron	100	99.5	0	0	0	0
2. p chloro phenyl	200	97.5	0	0	0	0
carbamoyl 6- bromo benz	100	99.0	1	0.3	0	0
isothiazoron						

2 - benzyl carbamoyl 6	200	99.0	0	0	0	0
chloro benz isothiazoro	100	99.5	1	0.3	0	0
Ruperon tables (comparison chemical agent)	17	99.5	10	3.0	3	0.8
Untreated area			53	13.5	26	6.7

In the above described table, ruperon tablets are a chemical that has mercury ethyl phosphate as the effective ingredient and for comparison reason, its result after 6 hours or dipping is shown. As clarified in Table 1, the chemicals of the present invention effectively inhibits baroku sprout diseases from infecting, and does not impact on the growth of the seeds in husks at all.

[Embodied example 2]

(Growth inhibition effect test of various plant pathogens)

Using chemical mixing gelatin culture medium testing method (line drawing method), whether or not the various pathogens growths are completely inhibited by 50 ppm or 100 ppm of chemicals concentration was tested. The result of the test is shown in Table 2.

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\*1: used concentration (ppm); \*2: rice/sesame leaf blight fungus,  
 \*3: cucumber fusarium wilt fungus, \*4: kidney bean anthrax fungus,  
 \*5: tomato leaves mildew disease fungus, \*6: grapes banfu fungus,

\*7: pear black spot fungus, \*8: rice bakatu sprout fungus, \*9: rice blast fungus and the like.

Table 2

Supplied chemicals for testing	*1	*2	*3	*4	*5	*6	*7	*8	*9
2- methyl carbamoyl benz isothiazoron 1	50 100	- +	- +	- +	- +	- +	- +	- +	- +
2- n butyl carbamoyl benz isothiazoron	50 100	- +	- +	+ +	- +	- +	- +	- +	- +
2- phenyl carbomolyl benz isothiazoron	50 100	- +	- +	- -	- -	- -	- +	- +	- +
2- p chloro phenyl carbamoyl benz isothiazoro	50 100	- -	- +	+ +	- -	- +	+ +	- -	+ +
2- benzyl carbamoyl benz isothiazoro	50 100	- +	- +	- +	- -	- -	- +	- +	- +
2- p chloro benzyl carbamoyl benz isothiazor	50 100	- +	- +	- +	- +	- +	+ +	- +	- +
2 -methyl carbamoyl 6- chloro benz isothiazoron	50 100	+ +	+ +	+ +	- +	+ +	+ +	+ +	- +
2. p chloro phenyl carbamoyl 6- bromo benz	50 100	- +	- -	- +	- +	+ +	- +	- +	- +

isothiazoron									
2 - benzyl carbamoyl	50	-	-	-	-	-	-	-	-
6 chloro benz	100	+	+	+	+	-	+	+	+
isothiazoro									

+: it shows there is a complete growth inhibition effect

-: there is no complete growth inhibition effect.

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These are the non medical fungicides characterized as containing the compound represented by the following general formula (I) as the effective ingredient, (however, in the formula, Y shows hydrogen atoms, or halogen atoms, R alkyl group, phenyl group, halophenyl group, benzene group or halobenzyl group).

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(57) The scope of the patent claim

I. general formula

